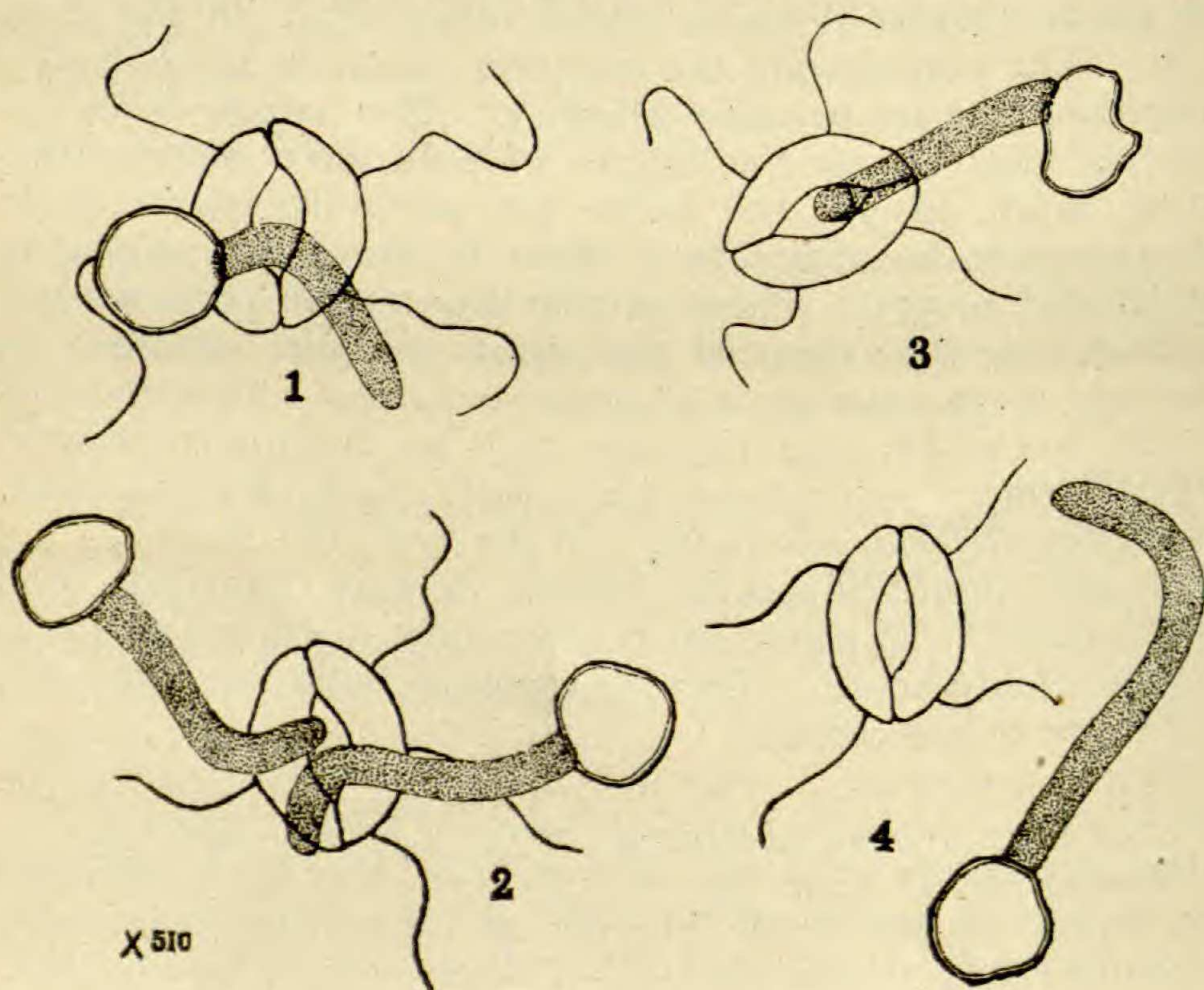


BRIEFER ARTICLES.

Penetration of the host by *Peronospora gangliformis*.—While studying the lettuce mould in the fall and winter of 1890, some observations were made by the writer on the penetration of its germ-tubes that differ from those heretofore recorded.

Spores of the fungus were sown in a drop of water upon the under surface of leaves of lettuce (*Lactuca sativa*). The leaves were kept in a moist atmosphere under a bell-glass in the laboratory. After twenty-four hours pieces of the epidermis were stripped off from the infected spots and examined under the microscope. The spores had germinated abundantly, pushing out a strong germ-tube into which the protoplasm of the spore had passed, leaving the empty, and often shriveled-up spore membrane attached to the germ-tube.



Several cases of penetration were seen, the germ-tubes pushing their way between the guard-cells of the stomata (figs. 1, 2 and 3). In other instances the germ-tubes had approached quite up to a stoma, but had not yet penetrated (fig. 2). Very many of the germ-tubes had grown straight forward for a time, and had then made a rather sudden turn, directing the terminal portion toward a stoma in the vicinity (figs. 2 and 4).

These observations are confirmed by those of Mr. A. J. Pieters, who obtained results from sowings of spores upon leaves of a growing plant. No cases of penetration through the walls of epidermal cells, as is said by De Bary¹ to be the rule for this species, were observed.—W. H. RUSH, *Botanical Laboratory, University of Michigan.*

EDITORIAL.

BOTANY is making a healthy and vigorous growth in the United States. Never before have there been so many teachers, so many investigators, or so many collectors advancing the interests of the science and making its merits known to the public, as at the present time. Probably no field of the science is now wholly without workers, a statement that could not have been made a few years ago; and what is really more to the purpose, a constantly increasing proportion of the work accomplished has a permanent value and attains a rank of commanding importance.

THE ORGANIZATION of the Botanical club of the A. A. A. S., in 1883, gave a decided impetus to American botany, and especially effected an improvement in the character of the investigations undertaken by individual workers. The movement set on foot last year in the same association, by which a prearranged series of papers covering certain portions of the higher grounds of the science is presented each year, must also prove valuable. These and other means for raising the standard of work for the individual, and for strengthening the reputation of the science among its friends, have already shown good results and justified the efforts put forth.

SO MUCH has already been accomplished that even greater things may be confidently looked for in the future. The coming meeting at Washington, which promises to have a larger attendance of botanists than ever before, should bring forth some new plans for general or co-operative work. Things may be accomplished by the united interest and effort of the many that would be difficult or impossible for single workers. So plain a truth needs no illustration, but its appreciation in solving specific problems may require considerable enforcement.

A MATTER to be borne in mind for the coming meeting is the unique opportunity afforded by the approaching World's Fair to secure some benefits for botany. A few European visitors of eminence may cer-

¹Ann. d. Sc. Nat. Bot. sér. 4. xx.